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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/651,159	08/30/2000	Ole Bentz	MTI-31072	2115

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ART UNIT	PAPER NUMBER
2124	5

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Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 07-01)

Office Action Summary	Application No. 09/651,159	Applicant(s) BENTZ, OLE
	Examiner Chat C. Do	Art Unit 2124

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>8/30/00; 9/9/00; 7/19/01</u> .

2a)☐ This action is **FINAL**.　　2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-20</u> is/are pending in the application.

　　4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-20</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

　　Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

　　If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

　　a)☐ All b)☐ Some * c)☐ None of:

　　　1.☐ Certified copies of the priority documents have been received.

　　　2.☐ Certified copies of the priority documents have been received in Application No. _____ .

　　　3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

　　* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

　　a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)
2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3)☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>3</u> .
4)☐ Interview Summary (PTO-413) Paper No(s). _____ .
5)☐ Notice of Informal Patent Application (PTO-152)
6)☐ Other: _____ .

DETAILED ACTION

Claim Rejections - 35 USC § 102

1.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the

basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2.   Claims 1-3, 6, 13-16, and 18-19 are rejected under 35 U.S.C. 102(b) as being anticipated

by Rim (U.S. 5,907,498).

Re claim 1, Rim discloses in Figure 3 a method of detecting overflow (abstract) in

a clamping circuit comprising the steps of: inputting a first operand (11) having a first

fixed-point format (abstract) into the clamping circuit; inputting a second operand (13)

having a second fixed-point format (abstract) into the clamping circuit; determining an

overflow output (15) based upon the first (output of 11) and second fixed-point format

(output of 13) and predicting whether an arithmetic operation of the first operand with the

second operand will yield a result that exceeds the overflow output (output of 15); and

performing at least partially the arithmetic operation (14) of the first and second

operands; wherein the determining and predicting step occurs substantially in parallel

with the performing step (simultaneous or parallel of 14-15).

Re claim 2, it has the same limitations as cited in claim 1 wherein the arithmetic operation is multiplication (ALU). Thus, claim 2 is also rejected under the same rationale in the rejection of rejected claim 1.

Re claim 3, Rim discloses in Figure 3 a method of clamping fixed-point multipliers (abstract): providing a first operand in a first fixed-point format (11); providing a second operand in a second fixed-point format (13); at least partially multiplying the first operand with the second operand to produce an operation result (14); determining whether the operation result will exceed a representable value (15); determining a clamping value based on the first fixed-point format of the first, operand and the second fixed-point format of the second operand (output of 15); and substituting the operation result with the clamping value (MAX) when it is determined that the operation result will exceed the representable value; wherein the multiplying step and determining whether the operation result will exceed the representable value step occur substantially in parallel (14 and 15 in parallel).

Re claim 6, it has the same limitations as cited in claim 1. Thus, claim 6 is also rejected under the same rationale in the rejection of rejected claim 1.

Re claim 13, it has the same limitations as cited in claim 1. Thus, claim 13 is also rejected under the same rationale in the rejection of rejected claim 1.

Re claim 14, it has the same limitations as cited in claim 1. Thus, claim 14 is also rejected under the same rationale in the rejection of rejected claim 1.

Re claim 15, it is a circuit claim of claim 1. Thus, claim 15 is also rejected under the same rationale in the rejection of rejected claim 1.

Re claim 16, it is a circuit claim of claim 1. Thus, claim 16 is also rejected under

the same rationale in the rejection of rejected claim 1. In addition, Rim further discloses

in Figure 3 a multiplexer (17) for selecting an output according to the overflow control.

Re claims 18-19, they have the same limitation cited in claim 8. Thus, claims 18-

19 are also rejected under the same rationale in the rejection of rejected claim 8.

Claim Rejections - 35 USC § 103

3.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
> such that the subject matter as a whole would have been obvious at the time the invention was made to a person
> having ordinary skill in the art to which subject matter pertains. Patentability shall not be negatived by the
> manner in which the invention was made.

4.   Claims 4-5, 7-12, 17, and 20 are rejected under 35 U.S.C. 103(a) as being obvious over

Rim (U.S. 5,907,498) in view of Ishikawa (U.S. 5,508,951) in further view of Handlogten (U.S.

5,943,249).

Re claim 4, Rim discloses in Figure 3 a method of clamping fixed-point

multipliers with all the limitations as cited in claim 1. Rim discloses in Figure 3 a most

significant bit of the product (C30) connect to overflow detector, but does not disclose a

logically ORing the simple clamp predictor with a most significant bit of the product.

Rim does not disclose a step of counting a number of leading logical zeros in the positive

operands, leading logical ones in the negative operands, and then sum them up.

However, Ishikawa clearly discloses in Figure 2 an overflow detector includes a logically

Oring the simple clamp predictor (carr from next higher-order position) with a most

significant bit of the product (most significant bit in ALU5). Handlogten discloses in

Figure 3 an step of detecting overflow including a step of counting a number of leading

logical zeros (LZO) in the positive operands, leading logical ones (LZA) in the negative

operands, and then sum them up. Therefore, it would have been obvious to a person

having ordinary skill in the art at the time the invention is made to add an OR the

overflow predictor and the most significant bits of arithmetic operation as seen in

Ishikawa's invention and a step of counting LZO, LZA, and sum up as seen in

Handlogten's invention into Rim's invention because it would enable to reduce the

circuitry and improve the system performance for detecting overflow.

Re claim 5, Rim further discloses in Figure 3 the computing step and determining

the clamping decision to yield the simple clamp predictor step occur substantially in

parallel (14 and 15).

Re claim 7, it has the same limitations as cited in claim 4. Thus, claim 7 is also

rejected under the same rationale in the rejection of rejected claim 4.

Re claim 8, Rim further discloses in Figure 3 the first and second operands are in

a fixed-point format (abstract and col. 3 lines 30-45).

Re claim 9, Rim does not disclose the most significant bit of the result is logically

inverted prior to the logically ORing step. However, Ishikawa discloses in Figure 3 the

most significant bit of the result is logically inverted prior to the logically ORing step (8).

Therefore, it would have been obvious to a person having ordinary skill in the art at the

time the invention is made to add the most significant bit of the result is logically inverted

prior to the logically ORing as seen in Ishikawa's invention into Rim's invention because it would enable to reduce the circuitry and improve the system performance for detecting overflow.

Re claim 10, Rim in view of Ishikawa does not disclose the step of determining the initial clamping predictor bit includes determining a number of logical zeros in each of the operands and summing the number of logical zeros to determine whether the sum exceeds a pre-determined number to determine the initial clamping predictor bit. However, Handlogten discloses in Figure 3 the step of determining the initial clamping predictor bit includes determining a number of logical zeros in each of the operands and summing the number of logical zeros to determine whether the sum exceeds a pre-determined number to determine the initial clamping predictor bit (LZO). Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention is made to add a step of determining the initial clamping predictor bit includes determining a number of logical zeros in each of the operands and summing the number of logical zeros to determine whether the sum exceeds a pre-determined number to determine the initial clamping predictor bit as seen in Handlogten's invention into Rim in view of Ishikawa's invention because it would enable to reduce the circuitry and improve the system performance for detecting overflow.

Re claim 11, Rim in view of Ishikawa does not disclose the step of determining the initial clamping predictor bit includes determining a number of logical ones in each of the operands and summing the number of logical ones to determine whether the sum exceeds a pre-determined number. However, Handlogten discloses in Figure 3 the step

of determining the initial clamping predictor bit includes determining a number of logical ones in each of the operands and summing the number of logical ones to determine whether the sum exceeds a pre-determined number (LZA). Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention is made to add a step of determining the initial clamping predictor bit includes determining a number of logical ones in each of the operands and summing the number of logical ones to determine whether the sum exceeds a pre-determined number as seen in Handlogten's invention into Rim in view of Ishikawa's invention because it would enable to reduce the circuitry and improve the system performance for detecting overflow.

Re claim 12, it has the same limitations as cited in claims 10-11. Thus, claim 12 is also rejected under the same rationale in the rejection of rejected claims 10-11.

Re claim 17, it has a same limitation cited in claim 4. Thus, claim 17 is also rejected under the same rationale in the rejection of rejected claim 4.

Re claim 20, it is a circuit claim of claim 4. Thus, claim 20 is also rejected under the same rationale in the rejection of rejected claim 4.

Conclusion

6.   The prior art made of record and not relied upon is considered pertinent to applicant's

disclosure.

a.   U.S. Patent No. 5,889,689 to Alidina et al. disclose a hierarchical carry-select,

three-input saturation.

b.   U.S. Patent No. 5,936,870 to Im discloses an arithmetic operating device for

digital signal processing and method therefor.

c.   U.S. Patent No. 5,448,509 to Lee et al. disclose an efficient hardware handling of

positive and negative overflow resulting from arithmetic operations.

Any inquiry concerning this communication or earlier communicati99ons from the

examiner should be directed to Chat C. Do whose telephone number is (703) 305-5655. The

examiner can normally be reached on M => F from 7:00 AM to 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Chaki Kakali can be reached on (703) 305-9662. The fax phone number for the

organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding

should be directed to the receptionist whose telephone number is (703) 305-3900.

Chat C. Do
Examiner
Art Unit 2124

September 5, 2003

CHUONG DINH NGO
PRIMARY EXAMINER